California Regional Water Quality Control Board
Santa Ana Region

RESOLUTION NO. 00-100

Resolution Approving Plans Submitted in Compliance with the Requirements of the Total Maximum Daily Load for Fecal Coliform in Newport Bay

WHEREAS, the California Regional Water Quality Control Board, Santa Ana Region (hereinafter Regional Board), finds that:

1. On April 9, 1999, the Regional Board adopted Resolution No. 99-10, which amended the Water Quality Control Plan for the Santa Ana River Basin (Basin Plan) to incorporate a Total Maximum Daily Load (TMDL) for fecal coliform in Newport Bay. The TMDL was subsequently approved by the State Water Resources Control Board, the Office of Administrative Law, and the U.S. Environmental Protection Agency.

2. The TMDL includes a fecal coliform implementation plan and schedule (Table 5-9g). This implementation plan requires the submittal of a number of proposed plans to conduct monitoring and other investigations. The TMDL requires that these plans be implemented in accordance with specific time periods after Regional Board approval of the plans.

3. The County of Orange, the Cities of Irvine, Tustin, Newport Beach, Lake Forest, Santa Ana, Orange and Costa Mesa, The Irvine Company and agricultural operators in the watershed were identified as parties responsible for fecal coliform discharges to Newport Bay.

4. In a January 7, 2000 letter to the responsible parties, the Regional Board's Executive Officer requested the submittal of the plans required by the TMDL. This request was made pursuant to the authority provided by Water Code Section 13267.

5. The Orange County Public Facilities and Resources Department (OCPF&RD) responded to the January 7, 2000 letter on behalf of the responsible parties in letters dated January 28, 2000, March 1, 2000, and March 31, 2000, and in e-mail correspondence on October 20, 2000. This correspondence provided proposed plans to: (1) conduct routine bacterial quality monitoring; (2) develop a fecal coliform transport and fate model; (3) conduct an assessment of REC-1 (water contact recreation) use in the Bay; (4) identify and characterize sources of fecal coliform input for (a) the Dunes Resort; (b) urban runoff (including stormwater), (c) agriculture (including stormwater) and (d) natural sources; and (5) evaluate the vessel waste program. The University of California Cooperative Extension, acting on behalf of the agricultural operators, submitted a report regarding the characterization of agricultural runoff as a source of fecal coliform inputs.

6. Staff has reviewed these proposed plans and finds that the plans to develop the fecal coliform fate and transport model, to conduct the REC-1 beneficial use assessment, to identify and characterize sources of fecal coliform input to the Dunes Resort, to identify and characterize sources of fecal coliform in agricultural runoff, and to

evaluate the vessel waste program are adequate. The plans to identify and characterize sources of fecal coliform input via urban runoff and natural sources are not adequate.

NOW, THEREFORE, BE IT RESOLVED THAT:

The Regional Board approves the plans for development of the fecal coliform transport and fate model, the REC-1 beneficial use assessment, identification and characterization of sources of fecal coliform input to the Dunes Resort, identification and characterization of sources of fecal coliform in agricultural runoff, and evaluation of the vessel waste program.

I, Gerard J. Thibeault, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of a resolution adopted by the California Regional Water Quality Control Board, Santa Ana Region, on November 17, 2000.

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Gerard J. Thibeault
Executive Officer

Attachment to Resolution No. 99-10

Amendment to the Santa Ana Region Basin Plan

Chapter 5 - Implementation Plan, Discussion of Newport Bay Watershed (page 5-39 et seq.)

3. Bacterial Contamination

Bacterial contamination of the waters of Newport Bay can directly affect two designated beneficial uses: water-contact recreation (**REC-1**) and shellfish harvesting (**SHEL**). The Orange County Health Care Agency (OCHCA) conducts routine bacteriological monitoring and more detailed sanitary surveys as necessary, and is responsible for closure of areas to recreational and shellfish harvesting uses if warranted by the results.

Because of consistently high levels of total coliform bacteria, the upper portion of Upper Newport Bay (Upper Bay) has been closed to these uses since 1974. In 1978, the shellfish harvesting prohibition area was expanded to include all of the Upper Bay, and the OCHCA generally advises against the consumption of shellfish harvested anywhere in the Bay. Bacterial objectives established to protect shellfish harvesting activities are rarely met in the Bay. (Fecal coliform objectives for the protection of shellfish harvesting and water-contact recreation are shown in Chapter 4, "Enclosed Bays and Estuaries". The OCHCA has relied on total coliform standards specified in the California Health and Safety Code. Fecal coliform are a subset of total coliform.) Certain areas in the lower parts of the Upper Bay and in Lower Newport Bay (Lower Bay) are also closed to water-contact recreation on a temporary basis, generally in response to storms. In these areas, there is generally good compliance with water-contact recreation bacterial objectives in the summer.

Data collected by the OCHCA demonstrate that tributary inflows, composed of urban and agricultural runoff, including stormwater, are the principal sources of coliform input to the Bay. As expected, there are more violations of bacterial standards in the Bay during wet weather, when tributary flows are higher, than in dry weather. There are few data on the exact sources of the coliform in this runoff. Coliform has diverse origins, including: manure fertilizers which may be applied to agricultural crops and to commercial and residential landscaping; the fecal wastes of humans, household pets and wildlife; and other sources. Special investigations by OCHCA have demonstrated that food wastes are a significant source of coliform. Many restaurants wash down equipment and floor mats into storm drains tributary to the Bay and may improperly dispose of food waste such that it eventually washes into the Bay. Such discharges likely contribute to the chronic bacterial quality problems in certain parts of the Bay.

Another source of bacterial input to the Bay is the discharge of vessel sanitary wastes. Newport Bay has been designated a no-discharge harbor for vessel sanitary wastes since 1976. Despite this prohibition, discharges of these wastes have continued to occur. Since these wastes are of human origin, they pose a potentially significant public health threat.

The Regional Board, the City of Newport Beach (City), the County of Orange, the City of Newport Beach Harbor Quality Committee, and other parties have taken or stimulated actions to enforce the vessel waste discharge prohibition. The principal focus of these efforts has been to make compliance with the prohibition convenient and therefore more likely. Vessel waste pumpouts have been installed at key locations around the Bay and are inspected routinely by the OCHCA. A City ordinance addresses people-intensive boating activities to ensure proper disposal of sanitary wastes. The ordinance requires that sailing clubs, harbor tour, and boat charter operations install pumpouts for their vessels. Another City ordinance addresses vessel waste disposal by persons living on their boats. Efforts have also been made to ensure that there are adequate public rest rooms onshore. The City also sponsors an extensive public education campaign designed to advise both residents and visitors of the discharge prohibition, the significance of violations, and of the location of pumpouts and rest room facilities. The effectiveness of these extensive vessel waste control efforts is not known.

As noted, the fecal waste of wildlife, including waterfowl that inhabit the Bay and its environs, is a source of coliform input. The fecal coliform from these natural sources may contribute to the violations of water quality objectives and the loss of beneficial uses, but it is currently unknown to what extent these natural sources contribute to, or cause, the violations of bacterial quality objectives in Newport Bay.

Reports prepared by Regional Board staff describe the bacterial quality problems in the Bay in greater detail and discuss the technical basis for the fecal coliform TMDL that follows (21, 22). Implementation of this TMDL is expected to address these bacterial quality problems and to assure attainment of water quality standards, that is, compliance with water quality objectives and protection of beneficial uses.

3.a. Fecal Coliform TMDL

A prioritized, phased approach to the control of bacterial quality in the Bay is specified in this TMDL. This approach is appropriate, given the complexity of the problem, the paucity of relevant data on bacterial sources and fate, the expected difficulties in identifying and implementing appropriate control measures, and uncertainty regarding the nature and attainability of the SHEL use in the Bay. The phased approach is intended to allow for additional monitoring and

assessment to address areas of uncertainty and for future revision and refinement of the TMDL as warranted by these studies.

Table 5-9f summarizes the TMDL, Waste Load Allocations (WLAs) for point sources of fecal coliform inputs and Load Allocations (LAs) for nonpoint source inputs. As shown, the TMDL, WLAs and LAs are established to assure compliance with water contact recreation standards no later than December 30, 2014 and with shellfish standards no later than December 30, 2019. WLAs are specified for vessel waste and urban runoff, including stormwater, the quality of which is regulated under a County-wide NPDES permit issued by the Regional Board. This runoff is thus regulated as a point source, even though it is diffuse in origin. LAs are specified for fecal coliform inputs from agricultural runoff, including stormwater, and natural sources. The TMDL is to be adjusted, as appropriate, based upon completion of the studies contained in Table 5-9g. Upon completion of these studies, an updated TMDL report will be prepared summarizing the results of the studies and making recommendations regarding implementation of the TMDL. The results of the studies may lead to recommendations for changes to the TMDL specified in Table 5-9f to assure compliance with existing Basin Plan standards (objectives and beneficial uses). The study results may also lead to recommendations for changes to the Basin Plan objectives and/or beneficial uses. If such standards changes are approved through the Basin Plan amendment process, then appropriate changes to the TMDL would be required to assure attainment of the revised standards. Revision of the TMDL, if appropriate, would also be considered through the Basin Plan amendment process.

Upon completion and consideration of the studies and any appropriate Basin Plan amendments, a plan for compliance with the TMDL specified in Table 5-9f, or with an approved amended TMDL, shall be established. It is expected that this plan will specify a phased compliance approach, based on consideration of such factors as geographic location, the priority assigned by the Regional Board to specific locations for control actions (see Section 3.a.ii, “Beneficial Use Assessment”), season, etc. Interim WLAs, LAs and compliance dates that lead to ultimate compliance with the TMDL will be established.

The TMDL and its allocations contain a significant margin of safety. The margin of safety can be either incorporated implicitly through analytical approaches and assumptions used to develop the TMDL or added explicitly as a separate component of the TMDL. A substantial margin of safety is implicitly incorporated in the TMDL in the fact that the TMDL does not apply criteria for dilution, natural die-off, and tidal flushing. The TMDL, WLAs, and LAs are established at concentrations equivalent to the water quality objectives.

Table 5-9f: Total Maximum Daily Load, Waste Load Allocations, and Load Allocations for Fecal Coliform in Newport Bay

Total Maximum Daily Load for Fecal Coliform In Newport Bay	**Waste Load Allocations for Fecal Coliform in Urban Runoff, including stormwater, Discharges to Newport Bay**	**Load Allocations for Fecal Coliform in Agricultural Runoff, including stormwater, Discharges to Newport Bay**	**Load Allocations for Fecal Coliform from Natural Sources in all Discharges to Newport Bay**	**Waste Load Allocations for Vessel Waste**
As soon as possible but no later than December 30, 2013			**In Effect**	**In Effect**
5-Sample/30-days Geometric Mean less than 200 organisms/100 mL, and not more than 10% of the samples exceed 400 organisms/ 100 mL for any 30-day period.	5-Sample/30-days Geometric Mean less than 200 organisms/100 mL, and not more than 10% of the samples exceed 400 organisms/ 100 mL for any 30-day period.	5-Sample/30-days Geometric Mean less than 200 organisms/ 100 mL, and not more than 10% of the samples exceed 400 organisms/ 100 mL for any 30-day period.	5-Sample/30-days Geometric Mean less than 200 organisms/100 mL, and not more than 10% of the samples exceed 400 organisms/ 100 mL for any 30-day period.	0 MPN/100 mL No discharge.
As soon as possible but no later than December 30, 2019				**In Effect**
Monthly Median less than 14 MPN/100 mL, and not more than 10% of the samples exceed 43 MPN/100 mL.	Monthly Median less than 14 MPN/100 mL, and not more than 10% of the samples exceed 43 MPN/100 mL.	Monthly Median less than 14 MPN/100 mL, and not more than 10% of the samples exceed 43 MPN/100 mL.	Monthly Median less than 14 MPN/100 mL, and not more than 10% of the samples exceed 43 MPN/100 mL.	0 MPN/100 mL No discharge.

Table 5-9g: Fecal Coliform Implementation Plan/Schedule Report Due Dates

Task	Description	Compliance Date-As soon As Possible but No Later Than
Task 1	Routine Monitoring Program (Section 3.a.ii.a) a) Submit Proposed Routine Monitoring Plan(s)[1] b) Implement Routine Monitoring Plan(s) c) Submit Monthly and Annual Reports (Reporting Period: April 1-March 31)	 a) January 30, 2000 b) Upon Regional Board Approval of Plan(s) c) Monthly within 30 days, Annual Report by September 1
Task 2	Water Quality Model for Bacterial Indicators (Section 3.a.ii.b) a) Submit Proposed Model Development Plan b) Submit Calibrated Model and Model Documentation	 a) January 30, 2000 b) 13 months after Regional Board approval of plan(s)
Task 3	Beneficial Use Assessment Plan (Section 3.a.ii.c) Submit Proposed Assessment Plan for: a) REC-1 b) SHEL	 a) January 30, 2000 b) March 1, 2001
Task 4	Beneficial Use Assessment Report (3.a.ii.c) Submit Beneficial Use Assessment Report for: a) REC-1 b) SHEL	 a) 13 months after Regional Board approval of plan(s) b) 13 months after Regional Board approval of plan(s)
Task 5	Source Identification and Characterization Plan(s) (Section 3.a.ii.d) Submit Proposed Source Identification Plans for: a) The Dunes Resort b) Urban Runoff (including stormwater) c) Agriculture (including stormwater) d) Natural Sources	 a) March 1, 2000 b) March 1, 2000 c) April 1, 2000 d) April 1, 2000

Table 5-9g: Fecal Coliform Implementation Plan/Schedule Report Due Dates		
Task	**Description**	**Compliance Date-As Soon As Possible but No Later Than**
Task 6	Source Identification and Characterization Reports (Section 3.a.ii.d) Submit Source Identification and Characterization Reports for: a) The Dunes Resort b) Urban Runoff (including stormwater) c) Agriculture (including stormwater) d) Natural Sources	 a) 7 months after Regional Board approval of plan(s) b) 13 months after Regional Board approval of plan(s) c) 16 months after Regional Board approval of plan(s) d) 16 months after Regional Board approval of plan(s)
Task 7	Evaluation of Vessel Waste Program (Section 3.a.ii.e) a) Submit Proposed Plan for Evaluating the Current Vessel Waste Program b) Submit Report on the Evaluation of the Vessel Waste Program	 a) April 1, 2000 b) 12 months after Regional Board approval of plan
Task 8	TMDL, WLA, and LA Evaluation and Source Monitoring Program (Section 3.a.ii.f) a) Submit Proposed Evaluation and Source Monitoring Program Plan(s) b) Implement Evaluation and Source Monitoring Plan(s) c) Submit Monthly and Annual Reports (Reporting Period: April 1-March 31)	 a) 3 months after completion of Tasks 2, 4a, and 6 b) Upon Regional Board approval of plan(s) c) Monthly within 30 days, Annual Report by September 1
Task 9	Updated TMDL Report Submit updated TMDL report for: a) REC-1 b) SHEL	 a) 6 months after completion of Tasks 2, 4a, 6, and 7 b) 6 months after completion of Tasks 2, 4b, 6, and 7

Table 5-9g: Fecal Coliform Implementation Plan/Schedule Report Due Dates		
Task	**Description**	**Compliance Date-As Soon As Possible but No Later Than**
Task 10	Adjust TMDL, if necessary; adopt interim WLAs, LAs, and Compliance Dates (Section 3.a.ii.h) a) REC-1 b) SHEL	 a) 12 months after completion of Updated TMDL Report for REC-1 (Task 9.a) b) 12 months after completion of Updated TMDL Report for SHEL (Task 9.b)
[1]Note: Provided that the monitoring program plan(s) fulfills the minimum requirements specified in this TMDL, approval of the TMDL shall constitute Regional Board approval of the monitoring program plan(s).		

3.a.i. TMDL Implementation

As soon as possible but no later than the dates specified in Table 5-9g, the County of Orange, the Cities of Tustin, Irvine, Costa Mesa, Santa Ana, Orange, Lake Forest and Newport Beach and agricultural operators in the Newport Bay watershed shall submit the plans and schedules shown in Table 5-9g and described in Section 3.a.ii. Subsequent phases of TMDL implementation shall take into account the results of the monitoring and assessment efforts required by the initial study phase of the TMDL implementation plan and other relevant studies.

The following sections describe the requirements for the submittal of plans by dischargers in the Newport Bay watershed to complete specific monitoring, investigations and analyses. In each and every case, the plans submitted by the named dischargers will be considered for approval by the Regional Board at a duly noticed public hearing as specified in Chapter 1.5, Division 3, Title 23 of the California Code of Regulations (Section 647 et seq.). The plans are to be implemented upon Regional Board approval and completed as specified in Table 5-9g.

3.a.ii. Monitoring and Assessment

Routine monitoring and special investigations and analyses are an important part of this phased TMDL. Routine monitoring is necessary to assess compliance with the bacterial quality objectives in the Bay and with the WLAs and LAs specified in the TMDL. Special investigations and analyses are needed to identify and characterize sources of fecal coliform input and to determine their fate in the Bay so that appropriate control measures can be developed and implemented. The effectiveness of current and future bacterial control measures needs to be evaluated. The results of these studies may warrant future changes to this TMDL.

3.a.ii.a. Routine Monitoring

By January 30, 2000, the County of Orange, the Cities of Tustin, Irvine, Costa Mesa, Santa Ana, Orange, Lake Forest and Newport Beach, and the agricultural operators in the Newport Bay watershed shall propose a plan for routine monitoring to determine compliance with the bacterial quality objectives in the Bay. At a minimum, the proposed plan shall include the collection of five (5) samples/30-days at the stations specified in Table 5-9h and shown in Figure 5-1

and analysis of the samples for total and fecal coliform and enterococci. Reports of the collected data shall be submitted monthly. An annual report summarizing the data collected for the year and evaluating compliance with the water quality objectives shall be submitted by September 1 of each year.

In lieu of this coordinated, regional monitoring plan, one or more of the parties identified in the preceding paragraph may submit an individual or group plan to conduct routine monitoring in areas solely within their jurisdiction to determine compliance with the bacterial objectives in the Bay (if appropriate). Any such individual or group plans shall also be submitted by January 30, 2000. Reports of the data collected pursuant to approved individual/group plan(s) shall be submitted monthly and an annual report summarizing the data and evaluating compliance with water quality objectives shall be submitted by September 1 of each year.

The monitoring plan(s) shall be implemented upon Regional Board approval.

Table 5-9h

Newport Bay Sampling Stations for Routine Compliance Monitoring with Bacterial Quality Objectives (see Figure 1 for Station Locations)

Ski Zone	33rd Street	Park Avenue
Vaughns Launch	Rhine Channel	Via Genoa
Northstar Beach	De Anza	Alvarado/Bay Is.
Abalone Avenue	Promontory Pt.	10th Street
Dunes East	Bayshore Beach	15th Street
Dunes Middle	Onyx Avenue	19th Street
Dunes West	Garnet Avenue	Lido Island Yacht Club
Dunes North	Ruby Avenue	Harbor Patrol
43rd Street	Sapphire Avenue	N Street Beach
38th Street	Newport Blvd. Bridge	Rocky Point
San Diego Creek @ Campus Dr.	Santa Ana Delhi Channel	Big Canyon Wash
Backbay Dr. Drain		

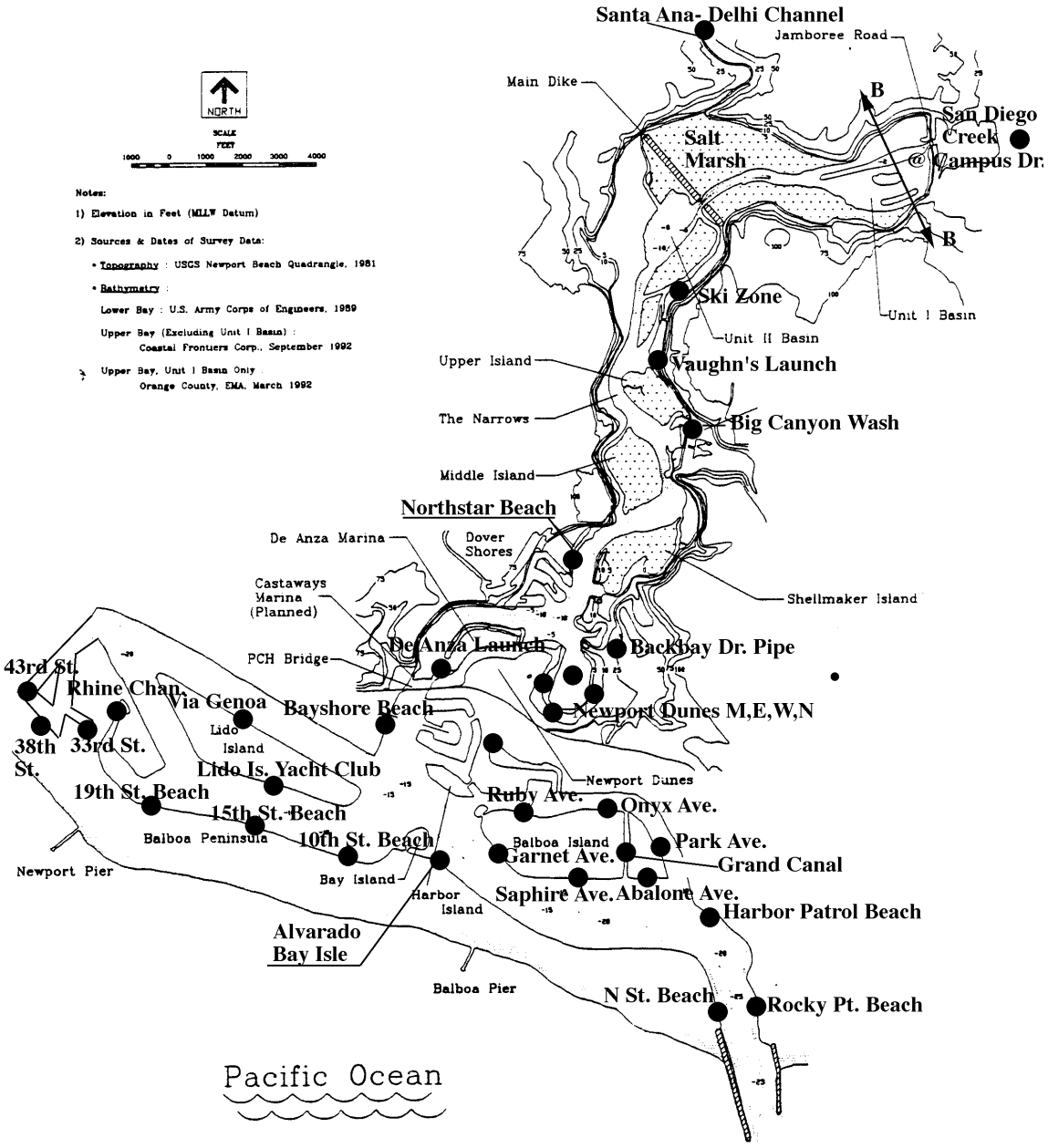

Figure 5-1: Newport Bay Bacterial Quality Monitoring Stations

3.a.ii.b. Fate of Bacterial Inputs

By January 30, 2000, the County of Orange, the Cities of Tustin, Irvine, Costa Mesa, Santa Ana, Orange, Lake Forest, and Newport Beach and the agricultural operators in the Newport Bay watershed shall submit a plan for the development and submittal of a water quality model to be completed by 13 months after Regional Board approval of the plan. The model shall be capable of analysis of fecal coliform inputs to Newport Bay, the fate of those inputs, and the effect of those inputs on compliance with bacterial quality objectives in the Bay.

3.a.ii.c. Beneficial Use Assessment

By January 30, 2000, the County of Orange, the Cities of Tustin, Irvine, Costa Mesa, Santa Ana, Orange, Lake Forest and Newport Beach shall submit a plan to complete, by 13 months after Regional Board approval of the plan, a beneficial use assessment to identify and quantify water contact recreation activities in Newport Bay. By 13 months after Regional Board approval of the beneficial use assessment plan, these parties shall submit a report of the results of the water contact recreation beneficial use assessment.

By March 1, 2001, the County of Orange , the Cities of Tustin, Irvine, Costa Mesa, Santa Ana, Orange, Lake Forest and Newport Beach shall submit a plan to complete, by 13 months after Regional Board approval of the plan, a beneficial use assessment to identify and quantify shellfish harvesting activities in Newport Bay. By 13 months after Regional Board approval of the beneficial use assessment plan, these parties shall submit a report of the results of the shellfish harvesting beneficial use assessment.

The beneficial use assessment reports shall contain recommendations for prioritizing areas within Newport Bay for purposes of evaluation and implementation of cost-effective and reasonable control actions as part of the TMDL process. The Regional Board will consider these recommendations and make its determinations regarding high priority water contact recreation and shellfish harvesting areas at a duly noticed public hearing. These determinations will be considered in establishing interim WLAs and LAs and compliance dates (Task 10, Table 5-9g).

3.a.ii.d. Source Identification and Characterization

By March 1, 2000, the County of Orange and the City of Newport Beach shall submit a proposed plan for a program, to be completed within 7 months after Regional Board approval of the plan to identify and characterize fecal coliform inputs to The Dunes Resort. In lieu of this coordinated plan, each of these parties may submit an individual plan to identify and characterize fecal coliform inputs to The Dunes Resort. Any such individual plan shall also be submitted by March 1, 2000 and completed within 7 months after Regional Board approval of the plan(s).

By March 1, 2000, the County of Orange and the Cities of Tustin, Irvine, Costa Mesa, Santa Ana, Orange, Lake Forest, and Newport Beach shall submit a proposed plan for a program, to be completed within 13 months after Regional Board approval of the plan to identify and characterize fecal coliform inputs to Newport Bay from urban runoff, including stormwater. In lieu of this coordinated, regional plan, one or more of these parties may submit an individual or group plan to identify and characterize fecal coliform inputs to the Bay from urban runoff from areas within its jurisdiction. Any such individual or group plan shall also be submitted by March 1, 2000 and completed within 13 months after Regional Board approval of the plan(s).

By April 1, 2000, the agricultural operators in the Newport Bay watershed shall submit a proposed plan for a program, to be completed within 16 months after Regional Board approval of the plan, to identify and characterize fecal coliform inputs to Newport Bay from agricultural runoff, including stormwater. In lieu of this coordinated plan, one or more of the agricultural operators may submit an individual or group plan to identify and characterize fecal coliform inputs to the Bay from agricultural runoff from areas within their jurisdiction. Any such individual or group plan shall also be submitted by April 1, 2000, and completed within 16 months after Regional Board approval of the plan(s).

By April 1, 2000, the County of Orange and the Cities of Tustin, Irvine, Costa Mesa, Santa Ana, Orange, Lake Forest, and Newport Beach shall submit a proposed plan for a program, to be completed within 16 months after Regional Board approval of the plan, to identify and characterize fecal coliform inputs to Newport Bay from natural sources. In lieu of this coordinated, regional plan, one or more of these parties may submit an individual or group plan to identify and characterize fecal coliform inputs to the Bay from natural sources from areas within its jurisdiction. Any such individual or group plan shall also be submitted by April 1, 2000 and completed within 16 months after Regional Board approval of the plan(s).

3.a.ii.e. Evaluation of Vessel Waste Control Program

By April 1, 2000, the County of Orange and the City of Newport Beach shall submit a plan to complete, by one year after Regional Board approval of the plan, an assessment of the effectiveness of the vessel waste control program implemented by those agencies in Newport Bay. The plan shall be implemented upon approval by the Regional Board. A report of the study results shall be submitted, together with recommendations for changes to the vessel waste program necessary to ensure compliance with this TMDL.

The Regional Board will consider appropriate changes to the vessel waste control program. These changes shall be implemented in accordance with a schedule to be established by the Regional Board.

3.a.ii.f. TMDL, WLA and LA Evaluation and Source Monitoring Program

By 3 months after completion of Tasks 2, 4a, and 6 as shown in Table 5-9g, the County of Orange, the Cities of Tustin, Irvine, Costa Mesa Santa Ana, Orange, Lake Forest and Newport Beach, and the agricultural operators in the Newport Bay watershed shall propose a plan for evaluation and source monitoring to determine compliance with the WLAs and LAs specified in Table 5-9f. In lieu of this coordinated, regional plan, one or more of these parties may submit an individual or group plan to conduct TMDL, WLA, LA and Source Evaluation monitoring from areas solely within their jurisdiction. Any such individual or group plan shall also be submitted by 3 months after completion of Tasks 2, 4a, and 6 as shown in Table 5-9g. Reports of the data collected pursuant to approved individual/group plan(s) shall be submitted monthly and an annual report summarizing the data and evaluating compliance with WLAs and LAs shall be submitted by September 1 of each year. The annual report shall also include an evaluation of the effectiveness of control measures implemented to control sources of fecal coliform, and recommendations for any changes to the control measures needed to ensure compliance with the TMDL, WLAs, and LAs.

The evaluation and source monitoring plan(s) shall be implemented upon Regional Board approval.

3.a.ii.g. Updated TMDL Report

The County of Orange, the Cities of Tustin, Irvine, Costa Mesa, Santa Ana, Orange, Lake Forest and Newport Beach, and the agricultural operators in the Newport Bay watershed shall submit Updated TMDL Reports as specified in Table 5-9g. These updated TMDL reports shall, at a minimum, integrate and evaluate the results of the studies required in Table 5-9g (Task 1 – 7). The

reports shall include recommendations for revisions to the TMDL, if appropriate and for interim WLAs, LAs and compliance schedules

3.a.ii.h. Adjust TMDL; Adopt Interim WLA, LAs and Compliance Dates

Based on the results of the studies required by Table 5-9g and recommendations made in the Updated TMDL Reports, changes to the TMDL for fecal coliform may be warranted. Such changes would be considered through the Basin Plan Amendment process. Upon completion and consideration of the studies and any appropriate Basin Plan amendments, interim WLAs and LAs that lead to ultimate compliance with the TMDL specified in Table 5-9f, or with an approved amended TMDL, will be established with interim compliance dates. Schedules will also be established for submittal of implementation plans for control measures to achieve compliance with these WLAs, LAs, and compliance dates. These implementation plans will be considered by the Regional Board at a duly noticed public hearing.

The Regional Board is committed to the review of this TMDL every three years or more frequently if warranted by these or other studies. The County of Orange, the Cities of Tustin, Irvine, Costa Mesa, Santa Ana, Lake Forest, and Newport Beach, The Irvine Company and the Irvine Ranch Water District have undertaken to prepare a health risk assessment for Newport Bay for water contact recreation and shellfish harvesting beneficial uses. This study will evaluate whether exceedances of fecal coliform objectives correlates with actual impairment of beneficial uses and may recommend revisions to the Basin Plan objectives and/or beneficial use designations. Because this study is in progress, it is not required by this TMDL implementation plan, but will be considered in conjunction with the studies required by the implementation plan.

California Regional Water Quality Control Board
Santa Ana Region

November 17, 2000

ITEM: 15

SUBJECT: Total Maximum Daily Load for Fecal Coliform in Newport Bay: Consideration of Plans Submitted to Fulfill TMDL requirements (Resolution No. 00-100)

DISCUSSION:

On April 9, 1999, the California Regional Water Quality Control Board, Santa Ana Region (Regional Board), adopted Resolution No. 99-10, which amended the Water Quality Control Plan for the Santa Ana River Basin (Basin Plan) to establish a Total Maximum Daily Load (TMDL) for fecal coliform in Newport Bay. A copy of the TMDL is attached to this report.

The objective of the fecal coliform TMDL is to address bacterial water quality problems in Newport Bay that adversely affect its beneficial uses, including water contact recreation (REC-1) and shellfish harvesting (SHEL). These problems are described in the attachment ("3. Bacterial Contamination", page 1-2). Briefly, due to consistently high levels of total coliform bacteria, the upper portion of Upper Newport Bay (Upper Bay) has been closed to these uses since 1974. In 1978, the shellfish harvesting prohibition area was expanded to include all of the Upper Bay, and the Orange County Health Care Agency (OCHCA) generally advises against the consumption of shellfish harvested anywhere in the Bay. The bacterial objectives specified in the Basin Plan to protect shellfish harvesting activities are rarely met in the Bay. These objectives are significantly more stringent than those established to protect water contact recreation. In general, there is good compliance with the water contact recreation objectives in the summer (dry weather). However, certain areas of the Upper and Lower Bay are closed to water contact recreation on a temporary basis in response to wet weather. The Basin Plan bacterial quality objectives for both SHEL and REC-1 protection are based on fecal coliform bacteria.
(It may be noted that the OCHCA, which is responsible to post areas to warn against water contact recreation and shellfish harvesting, relies on a suite of bacterial indicators to assess public health risk (total coliform, *E. coli*, and enterococcus), pursuant to AB 411).

Data collected by the OCHCA demonstrate that tributary inflows, composed of urban and agricultural runoff, including stormwater, are the principal sources of coliform input to the Bay. As expected, there are more violations of bacterial standards in the Bay during wet weather, when tributary flows are higher, than in dry weather. There are few

data on the exact origin of the coliform in this runoff, but sources include manure (applied to agricultural crops and commercial and residential landscaping); fecal wastes from humans, household pets and wildlife; and food wastes from restaurants.

Table 5-9f shows the fecal coliform TMDL and the wasteload allocations and load allocations assigned to the identified sources. The TMDL is the density of fecal coliform organisms per volume of water. (It is the density of these organisms, and not their total number (or "load") that is significant with respect to the protection of beneficial uses. Thus, the TMDL is based on density rather than load.) The densities established in the TMDL are equivalent to the Basin Plan fecal coliform objectives for REC-1 and SHEL, with compliance to be achieved as soon as possible but no later than 2013 and 2019, respectively. As seen in this Table, a comparable approach is taken in specifying the wasteload and load allocations. The only exceptions are the allocations for vessel waste discharges. Wasteload allocations of zero are specified, reflecting the designation of Newport Bay as a "no discharge" harbor for vessel sanitary wastes.

Table 5-9g outlines an implementation plan leading to compliance with the TMDL and the REC-1 and SHEL water quality objectives. This plan requires that a series of tasks be implemented, resulting in the development of an updated TMDL report (Task 9). Based on the updated TMDL report, the TMDL would be adjusted, if necessary, and interim wasteload and load allocations and schedules would be established. This phased approach was adopted in recognition of the limited data used in the development of the TMDL and the need to conduct investigations to assure that any requisite control measures are justified and reasonable.

Table 5-9g requires that proposed plans be submitted to implement the tasks identified therein. It also specifies that the plans are to be implemented within specified time frames once the plans are approved by the Regional Board.

Orange County, the Cities within the watershed (Santa Ana, Costa Mesa, Newport Beach, Orange, Lake Forest and Tustin), The Irvine Company and agricultural operators in the watershed are responsible for fecal coliform discharges to Newport Bay. These parties are thus responsible to prepare the plans required by the TMDL and to implement them once approved by the Board. Accordingly, on January 7, 2000, the Board's Executive Officer sent a letter to these parties, requesting the submittal of proposed plans in accordance with the TMDL requirements. These plans are to address the following areas stated in the TMDL:

1. *Routine Monitoring Program*
2. *Water Quality Model for Bacterial Indicators*
3. *Beneficial Use Assessment*
4. *Source Identification and Characterization –*
   Fecal coliform inputs to (a) the Dunes Resort, and fecal coliform inputs to Newport Bay from (b) urban runoff, including stormwater, (c) agricultural runoff, including stormwater, and (d) runoff from natural sources.
5. *Evaluation of Vessel Waste Control Program*

The Orange County Public Facilities and Resources Department (OCPF&RD), on behalf of all the parties, responded to the 13267 letter with 3 subsequent letters dated January 28, March 1, and March 31, 2000 which addressed items 1, 2, 3; 4(a & b); and 4(c&d), 5, respectively. On behalf of the agricultural operators, the University of California Cooperative Extension submitted a proposal regarding the characterization of agricultural inputs. Upon review of these letters, Board staff met with OCPF&RD staff on Sept. 11, 2000, to discuss the plans proposed in the above-mentioned letters. Board staff then sent (by email – October 5, 2000) a meeting summary and recommendations for plans for tasks that are not completed or for which Board staff had remaining concerns regarding the adequacy of the plans. OCPFRD then sent a return response by email (October 20, 2000) to Board staff's recommendations. Board staff also met with staff of the University of California Cooperative Extension to review the proposed agricultural source identification and characterization plan.

The following is a summary of these discussions, listed by task.

1. Routine Monitoring Program – The Orange County Health Care Agency (OCHCA) currently has a monitoring program by which weekly samples are collected at various Bay and tributary sites, and analyzed for total coliform, *E. coli*, and enterococci. This program meets most of the requirements for the TMDL; however, it does not monitor fecal coliform, which is required by the Basin Plan and the TMDL. Board staff indicated a willingness to consider the use of *E. coli* as a surrogate for fecal coliform, provided that a relationship could be demonstrated between *E. coli* and fecal coliform in Newport Bay waters.

Data were presented by Doug Moore (OCHCA) that demonstrated a significant relationship between *E. coli* and fecal coliform for ocean samples; however, no such relationship has been demonstrated for Newport Bay samples.

Recommendation: Board staff recommends that the Board not approve the proposed routine monitoring plan but instead adopt requirements for the implementation of fecal coliform monitoring (Item 16).

2. Water Quality Model for Bacterial Indicators – A Health Risk Assessment (HRA) is being conducted for the Bay under the auspices of many of the watershed stakeholders. The development of a water quality model capable of evaluating bacterial inputs and fate is a key component of that effort. The development of that model is already underway, with Board staff participation. Staff believes that this model effort satisfies this requirement of the TMDL, provided that the model is capable of analyzing fecal coliform inputs to the Bay. Assurances have been provided that this is the case.

Recommendation: Board staff recommends that the Regional Board approve the proposed plan for water quality model development, provided that the model is capable of analyzing fecal coliform inputs to Newport Bay.

3. ***Beneficial Use Assessment*** – The Health Risk Assessment also includes the assessment of water contact recreational (REC-1) activities in Newport Bay. An acceptable assessment has already been completed. (A workplan to conduct the SHEL assessment is due February 1, 2001.)

Recommendation: Board staff recommends that the Regional Board approve the plan for the REC-1 beneficial use assessment.

4. Source Identification and Characterization – including fecal coliform (FC) inputs to (a) the Dunes Resort, (b) Newport Bay from urban runoff, including stormwater, (c) Newport Bay from agricultural runoff, including stormwater, and (d) Newport Bay from natural sources.

(a) FC inputs to the Dunes Resort – On behalf of the City of Newport Beach, Board staff is overseeing the conduct of a genetic testing program designed to evaluate sources of pathogen inputs to the Bay. OCPF&RD proposed that one task (Dunes shedding study) of the City of Newport Beach contract would satisfy the source identification and characterization requirements for the Dunes Resort. Staff believes that this proposal is valid; however, staff put OCPF&RD on notice that since more money was required for the genetic sampling plan than was originally anticipated, the Dunes study will most likely require additional funds beyond those obtained in the Newport Beach contract. The Newport Bay Genetic Sampling Group (Board staff, City of Newport Beach, OCHCA, and Southern California Coastal Research Project (SCCWRP)) will design a study over the winter to address fecal coliform inputs to the Dunes Resort, and implement this study in summer 2001.

Board staff is in agreement with this approach.

(b) FC inputs to Newport Bay - Urban Runoff – OCPF&RD proposed that the monitoring plan currently being carried out by the Irvine Ranch Water District (IRWD) for the Health Risk Assessment be used to satisfy the source identification and characterization requirements of FC inputs from urban runoff. In this monitoring program, IRWD collects samples from 4 locations weekly, and from 16 locations biweekly and analyzes for total coliform, fecal coliform and MS2 phage. Board staff advised OCPF&RD of our concern that this proposal would not be adequate since it would not distinguish urban runoff from other types of inputs. OCPF&RD responded that it would be appropriate to rely on the HRA to determine whether sources created a bacterial quality problem in Newport Bay recreational areas. OCPF&RD argues that under their recommended approach, it would be unnecessary to partition fecal coliform loads into separate source categories (i.e., urban, agricultural, natural), unless the load from a particular tributary or drain was shown to be a health risk in the Bay (via the HRA

water quality and risk assessment models). OCPF&RD recommended that preliminary characterizations be conducted, including the development of a simple fecal coliform budget based on available information, small-scale wildlife assessments (to evaluate natural source inputs, see (d)), and utilization of information from other studies (Huntington Beach, Aliso Creek (in the San Diego Region)) regarding the sources, fate and transport of bacterial indicators.

While Board staff believes that such characterizations would have merit, we are not persuaded that the proposal is adequate to address the requirements of the TMDL. Moreover, we are not persuaded of the validity of the underlying premise of OCPF&RD's arguments, that is, that characterizations are not necessary unless a problem is demonstrated by the HRA. Finally, it is not clear when the HRA will be completed, given current controversy about the pathogen indicators proposed for use therein.

Board staff proposes to continue to work with the stakeholders to develop an acceptable urban runoff characterization plan.

(c) FC inputs to Newport Bay - Agricultural Runoff – Board staff met with staff of the U.C. Cooperative Extension (UCCE) on October 17, 2000 to discuss this task. UCCE is taking the lead for the Orange County Farm Bureau and area farmers to comply with the TMDL. UCCE has agreed to add the monitoring of fecal coliform to a nutrient study that is currently being set up. This study will look at runoff from various representative agricultural sites in the Newport watershed.

Board staff is in agreement with this approach.

(d) FC inputs to Newport Bay - from natural sources. OCPF&RD proposed to estimate FC inputs from natural sources via back calculations from the water quality model. What this means is that FC inputs from urban and agricultural runoff will be subtracted from the total FC inputs (and outputs), and the remainder will be attributed to natural sources.

Board staff has some concerns with this approach and would prefer to develop an independent estimate of FC inputs from natural sources. For example, FC loading from natural sources could be estimated from wildlife population surveys of Newport Bay since FC loading estimates for various wildlife populations are likely to be found in the literature. The Department of Fish & Game or the U.S. Fish & Wildlife Service or the Audubon Society are likely to have wildlife population estimates for Newport Bay. OCPF&RD agreed to investigate such studies for preliminary characterization.

However, as alluded to in the discussion of the urban runoff characterization plan, there appears to be a fundamental difference of opinion with respect to this task. Board staff believes that it is necessary to differentiate fecal coliform inputs due to urban runoff, agricultural runoff and natural sources so that independent estimates can be input to the

water quality model, and so that efforts at source control can be directed towards the correct dischargers. It is important to have independent estimates to enter into the water quality model so that total inputs may be checked against partial inputs. It is also important to have realistic estimates for each source so that control efforts may be targeted in the right direction. These control efforts may include education programs to residential households compared to outreach concerning public interaction with wildlife populations compared to education of farmers. However, OCPF&RD proposes to use the water quality model followed by the microbial risk model (health risk model) to determine if the current loads of FC are in fact a health risk to the public at high use sites, and then differentiate FC sources.

Board staff believes that realistic estimates of FC inputs from natural sources are necessary for compliance with the source identification/characterization of the TMDL and that estimates may be obtained without large expenditures to the stakeholders.

Board staff proposes to continue to work with the stakeholders to develop an acceptable natural source input characterization plan.

Recommendation: Board staff recommends that the Board approve the plans to identify FC inputs to the Dunes Resort and to evaluate FC inputs from agricultural runoff.

(5) Evaluation of Vessel Waste Control Program – OCPF&RD proposed that one task (Vessel Waste study) of the City of Newport Beach contract (genetic sampling plan) would satisfy this TMDL task. Staff believes that this proposal is valid; however, staff put OCPF&RD on notice that since more money was required for the genetic sampling plan than was originally anticipated, the vessel waste study will most likely require additional funds beyond those obtained in the Newport Beach contract. The Newport Bay Genetic Sampling Group (RWQCB, City of Newport Beach, OCHCA, SCCWRP) will design a study over the winter to address the control of vessel waste, and implement this study in summer 2001.

Board staff is in agreement with this approach.

Recommendation: Board staff recommends that the Board approve the proposed plan to evaluate the vessel waste control program.

OTHER ISSUES:

As explained above, the implementation of the various tasks required by the TMDL is contingent on the Board's approval of the plans proposed to carry out those tasks. For the most part, Board staff believes that the plans submitted are adequate and should be approved by the Board. However, we believe that additional work is necessary on the plans to conduct urban runoff and natural source characterizations. This work will

need to be completed before these plans can be recommended to the Board for approval. Staff is concerned that the Board approval process (and, thus, implementation of these tasks) might be delayed if a Board quorum is not available in the near future. Therefore, staff recommends that the Board delegate to the Executive Officer the authority to approve these plans, should it become necessary in the absence of a quorum.

RECOMMENDATION:

Adopt Resolution No. 00-100, approving the plans proposed to fulfill TMDL requirements as recommended by Board staff and authorizing the Executive Officer to approve the refined plans for the identification and characterization of urban and natural source fecal coliform inputs, if necessary.